

Ten Years of Inaction on Antimicrobial Resistance: An Environmental Scan of Policies in Canada from 2008 to 2018

Dix ans d'inaction face à la résistance aux antimicrobiens : analyse du contexte des politiques canadiennes de 2008 à 2018

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BOX 2. AMR research funding provided by the Canadian Institutes of Health Research, 2008–2018

Grant title	Description	Timing	Number of funded projects	Amount disbursed
Team Grant: Emerging Novel Alternatives Grant	For applications focused on novel approaches to antibiotic resistance, including research areas such as phage therapy or probiotics in which Canada had little or no research capacity	2007–2008	17	\$14,396,609
Canada–UK Joint Health Research Program on Antibiotic Resistance Catalyst Grant	To support the formation of Canadian/UK collaborations in the area of antibiotic resistance, building on the recommendations made at the Canada/UK workshop "Beating the Bugs"	2008	2	\$120,000
CAN–UK Team Grant	To create an environment in which UK and Canadian researchers working in the field of antibiotic resistance can combine their relative strengths to advance our understanding of antibiotic resistance and to develop strategies and interventions to mitigate the effects of antibiotic resistance at a population level	2010	2	\$3,977,900
JPIAMR InnovaResistance	To combine the resources, infrastructure and research strengths of multiple countries to overcome antibiotic resistance	2014	6	\$3,795,336
JPIAMR Transmission Dynamics	To understand the complex biological and environmental interactions that shape the spread of antibiotic resistance, identify and characterize the determinants that contribute to the spread of resistance in and between different reservoirs	2016	6	\$2,656,994
JPIAMR – Transnational Working Groups	To assemble motivated groups of leading experts and establish transnational working groups to enhance resource alignment and maximize existing and future efforts to combat AMR	2016	3	\$109,799
AMR Point of Care Diagnostics in Human Health Initiative: Expression of Interest	To advance innovative point-of-care diagnostics that distinguish bacterial infections from viral infections or identify at least one of the AMR priority pathogens by bringing together applicants and industry for a workshop to establish linkages	2016	16	\$136,289

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AMR Point of Care Diagnostics in Human Health Initiative PHASE 1	To advance innovative point-of-care diagnostics in human health that distinguish bacterial infections from viral infections or identify at least one of the AMR priority pathogens to a stage where these are ready for scale-up and, when appropriate, commercialize and implement	2016	5	\$1,394,976
Global Governance of Antimicrobial Resistance and Related Infectious Disease Threats Catalyst Grant	To support the planning, catalyst and pilot implementation of social science research projects focused on any topic relevant to improving our understanding of how to design and implement effective global governance arrangements, institutions and/or structures for addressing AMR	2017	3	\$300,000
JPIAMR Prevention and Intervention Strategies to Control AMR Infections Grant	To support the development of optimal intervention strategies across diverse cultural settings and heterogeneous systems of human health and animal health and food production	2017	7	\$3,226,672
AMR Point of Care Diagnostics in Human Health Initiative PHASE 2	To further accelerate development of technologies or tools that have passed the preliminary design developmental phase	2018	3	\$1,968,199
JPIAMR – Virtual Research Institute Grant	To fund a global network connecting research performing organizations, including institutes, centres and infrastructure across sectorial and geographic boundaries in a larger global network	2018	1	\$75,000
Network for Global Governance Research on Infectious Disease – Letter of Intent	To support the development of interdisciplinary research networks for global governance research on infectious diseases. To fund participation in a workshop to foster collaboration and support	2018	4	\$99,368
Project Grant: Priority Announcements	To support research on antimicrobial resistance	2018	3	\$300,000

TABLE 1. Communication interventions on AMR in Canada between 2008 and 2018

Intervention name	Description	Province	Setting	Intervention goals	Timing	Organization
Events						
Beating the Bugs	Canada–UK research workshop organized by the CIHR Institute for Infection and Immunity to address topics such as immune modulation, molecular determinants of resistance, clinical aspects and systems biology approaches	National	Academic	Bringing together of researchers with different perspectives on the problem of antibiotic resistance	2008	CIHR
Matters Events	A series of three one-day continuing medical education events: Urine Matters, Cough Matters and Antibiotic Matters with between 100 and 150 healthcare workers participating in each event. All three events included a discussion of antibiotic safety and overuse of antibiotics, with the third event also focusing exclusively on wise use of antibiotics and the potential for resistance	PEI	Healthcare	Promotion of evidence-based local guidelines	2015–2016	Health PEI, MSPEI and CADTH
CIHR Stewardship Workshop	CIHR hosted a Multi-Stakeholder Antimicrobial Stewardship Expert Forum with Merck Canada to bring together more than 80 participants and develop recommendations on improving antimicrobial stewardship.	National	Academic	Investment in the development of strong and effective antimicrobial stewardship programs in Canada and beyond	2016	CIHR and Merck Canada
Educational programs						
Bugs and Drugs	A program that provides general recommendations for appropriate antibiotic use and care of patients with infectious diseases	National	Healthcare	Limiting the development of resistance through the judicious use of antibiotics	1998–ongoing	Alberta Health Services; British Columbia Ministry of Health; Do Bugs Need Drugs?
Bugs and Drugs North West Territories	Bugs and Drugs was made a standard of practice in the Northwest Territories.	NWT	Healthcare	Limiting the development of resistance through the judicious use of antibiotics	2006–ongoing	NWT Antimicrobial Steering Committee
Bugs and Drugs Yukon	The Yukon adopted Bugs and Drugs as their organization and community resource, with access provided in all hospitals, physician offices and community health centres.	YK	Healthcare	Limiting the development of resistance through the judicious use of antibiotics	Not reported	Yukon Hospital Corporation

Intervention name	Description	Province	Setting	Intervention goals	Timing	Organization
MB Southern Health Pilot Project	Pilot project to adapt Do Bugs Need Drugs and Choosing Wisely Canada in the Southern Health–Sante Sud RHA/rural region of Manitoba	MB	Healthcare	Not reported	Not reported	NCCID; Southern Health–Sante Sud RHA
Do Bugs Need Drugs	Do Bugs Need Drugs? (DBND) is a community education program about handwashing and responsible use of antibiotics. Materials are available for healthcare professionals and the public that explain why antibiotic resistance is an issue and the steps to prevent antibiotic resistance from developing.					
Alberta	DBND was initially developed and piloted in Alberta and provides programs and materials for healthcare professionals, teachers, schools, preschools, workplaces, long-term care centres, parents, children and the public.	AB	Public/school	Explaining to professionals and the public why antibiotic resistance is an issue and taking steps to prevent antibiotic resistance	1998–ongoing	Alberta Health Services
British Columbia	DBND in British Columbia provides healthcare professional education and public education to children and their parents, teachers, older adults in care, their caregivers and the general public.	BC	Public/school		2005–ongoing	BC Centres for Disease Control
AntibioticWise.ca	The AntibioticWise.ca website supports the Do Bugs Need Drugs? media campaign initiatives in BC, directing the public to relevant and specific information about antibiotic stewardship and resistance.	BC	Public	Reducing the overuse and misuse of antibiotics at the individual and population level	2005–ongoing	Government of British Columbia; BCCDC; Do Bugs Need Drugs?
Not All Drugs Need Bugs	Public awareness campaign	NWT	Public	Raising awareness	2008	NWT Antimicrobial Steering Committee
Not All Bugs Need Drugs	A campaign featuring “Vinnie the Virus” with three messages: Not all bugs need drugs, wash your hands – prevent infection and antibiotics don’t work on viruses	NU	Public	Promotion of the responsible use of antibiotics in Nunavut	2008	Ministry of Health and Social Services
NARP Radio Broadcasts	Radio broadcasts aired on Saskatchewan’s Aboriginal Radio Network in English, Cree and Dene, aimed at teaching the general public about skin and soft tissue infections, handwashing and completing the entire course of antibiotics	SK	Public	Education and awareness	Not reported	Northern Antibiotic Resistance Partnership

Intervention name	Description	Province	Setting	Intervention goals	Timing	Organization
PHAC Public Awareness Campaign	AMR Education Campaign launched by the PHAC	National	Public	Raise Awareness	2014	PHAC
Antibiotic Awareness Week	NCCID has been working with a range of organizations engaged in awareness building on appropriate antimicrobial/antibiotic use as part of the annual Antibiotic Awareness Day.	National	Public	Antibiotic awareness week promotes cautious and correct use of antibiotics to help prevent and control the spread of bacteria that develop resistance to the medications.	Annual	NCCID, PHAC, AMMI Canada, Canadian Pharmacists Association, Canadian Patient Safety Institute, Infection Prevention and Control Canada, Choosing Wisely Canada, Alberta Health
SASS	Students for Antimicrobial Stewardship Society (SASS) is a student-led national organization dedicated to raising awareness of antimicrobial stewardship and resistance across Canada that supports a multidisciplinary approach to stewardship through collaboration with students from health professional programs, including dentistry, medicine, nursing, pharmacy and veterinary medicine.	National	Higher Education	Educating, supporting, connecting and representing our membership as they foster and champion a culture of stewardship and conscientious, evidence-informed use of antimicrobials	2015	Students for Antimicrobial Stewardship
#AntibioticWAKEUP Thunderclap	AMMI Canada and the NCCID organized a national "Thunderclap" – an online campaign that broadcast one resounding antibiotic awareness message across multiple social media accounts at the same time. Supported by healthcare organizations and patient safety proponents, it called for Canadians to use antibiotics wisely. Resources were shared to help professionals, patients and members of the public to learn and do more to keep antibiotics working.	National	Public	Improve awareness about wise use of antibiotics.	2017	AMMI Canada, NCCID
#KeepAntibioticsWorking	AMMI CANADA puts out statements about antimicrobial use using a Twitter campaign and the hashtag #KeepAntibioticsWorking.	National	Public	Improve awareness about wise use of antibiotics.	Ongoing	AMMI Canada

Intervention name	Description	Province	Setting	Intervention goals	Timing	Organization
Tools						
Virus Plan	The Virus Plan is a tool designed to educate patients/parents of pediatric patients who present with a viral illness and to provide additional instructions for managing a viral illness without antibiotics.	PEI	Healthcare	Educate patients/parents about managing a viral illness without antibiotics	2015	Family physicians, pediatricians and the PD&T Antimicrobial Stewardship Subcommittee
PEAK	Article published in Dispatch, in the section called Practice Enhancement and Knowledge (PEAK) entitled "Considerations for responsible antibiotic use in dentistry". The article was distributed to all members of the Royal College of Dental Surgeons of Ontario.	ON	Dentistry	Raise awareness	2016	Royal College of Dental Surgeons of Ontario
Correctional Services Canada – Education for Staff	CSC prepared a two-page sheet for staff about antibiotic stewardship, a chart review that CSC conducted, and CSC's proposed actions to improve antibiotic use in institutions.	National	Correctional Facilities	Educate staff about CSC's antimicrobial stewardship plan and planned improvements	2017	Correctional Services Canada
Correctional Services Canada – Education for Inmates	CSC prepared a fact sheet on the proper use of antibiotics that was distributed to all inmates. The fact sheet covered key messages about the proper use of antibiotics and the possibility of antibiotic resistance.	National	Correctional Facilities	Educate inmates about the proper use of antibiotics and antibiotic resistance	2017	Correctional Services Canada
Regina Area Initiatives	Regina Qu'Appelle Health Region has a resource website including viral prescription pads, pamphlets, archived presentations on AMR, resources from other organizations and updates targeting administrators and policy makers.	SK	Healthcare	Develop tools to aid in both patient and healthcare professional education around issues of antimicrobial stewardship	Ongoing	Regina Qu'Appelle Health Region
Spectrum Antibiotic Stewardship App	Smartphone app providing mobile access to clinical guidelines, antimicrobial formularies, antibiogram data and infection control protocols	National	Healthcare	Provide digital access to antimicrobial treatment guidelines and resources	Ongoing	Spectrum Mobile Health
Using Antibiotics Wisely	Campaign and resources developed by Choosing Wisely Canada in partnership with other organizations. Their target audiences bridge primary care practice and the public, which makes them highly relevant for community-based stewardship.	National	Public/Community Practice	Increase knowledge and practice of resource stewardship	Ongoing	Choosing Wisely Canada, PHAC, College of Family Physicians of Canada

Intervention name	Description	Province	Setting	Intervention goals	Timing	Organization
Action Plans						
Federal Framework for Action	Antimicrobial Resistance and Use in Canada: A Federal Framework for Action maps out a coordinated, collaborative federal approach to responding to the threat of antimicrobial resistance.	National	Government	Respond to the threat of antimicrobial resistance	2014	PHAC
Federal Action Plan	Federal Action Plan on Resistance and Use in Canada: Building on the Federal Framework for Action. The Framework maps out a coordinated, collaborative federal approach to responding to the threat of AMR.	National	Government	Respond to the threat of antimicrobial resistance	2015	PHAC
Pan-Canadian Framework for Action	Tackling Antimicrobial Resistance and Antimicrobial Use: Pan-Canadian Framework for Action. This document outlines the context and the foundation to guide a pan-Canadian approach.	National	Government	Strengthen Canada's ability to combat the risks of AMR in a coordinated, multisectoral and effective manner	2017	PHAC
Quebec Action Plan	Quebec is working to develop a ministerial action plan on antibiotic resistance.	QC	Government	N/A	Ongoing	Ministry for Health and Social Services

CADTH = Canadian Agency for Drugs and Technologies in Health; MSPEI = Medical Society of Prince Edward Island

TABLE 2. Fiscal interventions on AMR in Canada between 2008 and 2018

Intervention name	Description	Province	Setting	Intervention goals	Timing	Organization
World Bank Funding	Minister of Health announces US\$250,000 to the World Bank for a study on the economic impacts of AMR entitled "Drug-Resistant Infections: Threat to Our Economic Future."	National	Government	Support the 2017 World Bank Report	2015	Government of Canada
WHO Funding	Canada announces \$9 million to WHO to support implementation of the Global Action Plan.	National	Government	Support low- and middle-income countries to develop and implement their national action plans, and implement key AMR initiatives	2016	Government of Canada

TABLE 3. Guideline interventions on AMR in Canada between 2008 and 2018

Intervention name	Description	Province	Setting	Intervention goals	Timing	Organization
MRSA Guidelines	Standards for Prevention and Management of Methicillin-Resistant <i>Staphylococcus aureus</i> (MRSA)	AB	Healthcare	Minimize the risk of exposure to and prevent transmission of MRSA	2008	Alberta Health and Wellness
PEI Guidelines	PEI Health provides treatment guidelines on the Health PEI Microbiology site for sepsis, CAP, UTI, etc.	PEI	Healthcare	Disseminate antibiotic use guidelines	Not reported	Health PEI
MRSA Clinician Desk Reference	MRSA Clinician Desk Reference	NWT	Healthcare	Not reported	2010	Health and Social Services Northwest Territories
Medical Directive in LTC	Pilot program: medical directive to decrease ordering of urine cultures in two long-term care facilities	PEI	Long-Term Care	Decrease ordering of urine cultures	2014	Health PEI
Consensus Statement on Patients w/Total Joint Replacement	Consensus statement by three associations (Canadian Orthopedic Association, AMMI and Canadian Dental Association) stating no antibiotics for patients with total joint replacement	National	Dentistry	Reduce the unnecessary use of antibiotics in dentistry	2016	Canadian Dental Association; Canadian Orthopaedic Association; AMMI Canada

Intervention name	Description	Province	Setting	Intervention goals	Timing	Organization
Ontario Gonorrhoea Guidelines	Ontario Gonorrhoea Testing and Treatment Guide, 2nd Edition to facilitate diagnosis, and effective treatment and follow-up for cases and contacts, as well as slowing the emergence of extremely drug-resistant <i>N. gonorrhoeae</i> in Ontario	ON	Healthcare	Slow the emergence of extremely drug-resistant <i>N. gonorrhoeae</i>	2013/2018	Public Health Ontario
Canadian Guidelines for Sexually Transmitted Diseases	Treatment of <i>N. gonorrhoeae</i> in response to the discontinuation of spectinomycin: alternative treatment guidance statement	National	Healthcare	Not reported	2017	PHAC
CWC Dental Guidelines	A Dentistry Choosing Wisely Canada list that contains eight recommendations, four of which address dental cases where antibiotics are not necessary	National	Dentistry	Reduce the unnecessary use of antibiotics in dentistry	2018	Canadian Association of Hospital Dentists; Choosing Wisely Canada
Public Health Ontario Program	Resources, tools and presentations to guide development of stewardship programs in acute care, primary care and long-term care. Includes an interactive tool to compare program elements and strategies between Ontario hospitals	ON	Healthcare	Support research and resources to implement and sustain antimicrobial stewardship	Ongoing	Public Health Ontario

CAP = Community Acquired Pneumonia; LTC = Long-Term Care ; UTI = Urinary Tract Infection

TABLE 4. Regulatory interventions on AMR in Canada between 2008 and 2018

Intervention name	Description	Province	Setting	Intervention goals	Timing	Organization
SHS-UHN	The SHS-UHN ASP uses a collaborative and evidence-based approach to improve the quality of antimicrobial use by getting patients the right antibiotics, when they need those. The ASP follows Plan-Do-Study-Act quality improvement methodology to pursue the best possible clinical outcomes for its patients, relying heavily on patient-centred data. The program has been scaled up to a large network of hospitals (including community hospitals). The website also provides guidance on starting an antimicrobial stewardship program.	ON	Hospital	Ensure patients receive the right antibiotics when they need those	2009	Sinai Health System; University Hospital Network
Formulary Changes	Formulary changes affecting fidaxomicin, linezolid, daptomycin	PEI	Healthcare	Not reported	Not reported	Health PEI
Antibiotic Labelling	A standard stewardship statement is being required on all currently marketed antibiotics to encourage prudent prescribing.	National	Government	Encourage prudent prescribing	2015	Health Canada
Accreditation Canada Required Organizational Practices: AMS	Requires hospitals and long-term care facilities to have an AMS program to be accredited. Organizations are encouraged to tailor an approach to antimicrobial stewardship consistent with their size, service environment, and patient population, and to establish processes for ongoing monitoring and improvement of the program over time.	National	Hospital/ Long-Term Care	Optimize the use of antimicrobials to achieve the best patient outcomes, reduce the risk of infections, reduce or stabilize levels of antibiotic resistance and promote patient safety	2015	Accreditation Canada
ASP in Fraser Health Authority	Fraser Health Authority has conducted an authority-wide stewardship program including audit and feedback of prescribing, development of an ASP handbook and website, pre-printed order revisions and other quality improvement projects.	BC	Healthcare	Promote appropriate antimicrobial use within Fraser Health, optimize patient care and slow the emergence of antimicrobial resistance	Ongoing	Fraser Health Authority
Yukon Hospital Actions	A stewardship policy and working group, stewardship strategies such as pharmacy-initiated surveillance and physician reminders to switch from IV to PO antibiotics by day 3, a restricted antibiotic formulary and integration of AMS into the Infection Prevention and Control Committee with multidisciplinary representation from across the organization	YK	Hospital	Not reported	Ongoing	Yukon Hospital Corporation
Correctional Services Canada – Stewardship	Correctional Services Canada is developing a stewardship plan for their facilities.	National	Correctional Facilities	N/A	Ongoing	Correctional Services Canada

AMS = Antimicrobial Stewardship

SHS-UHN ASP = Sinai Health System – University Health Network Antimicrobial Stewardship Program

TABLE 5. Service provision interventions for AMR in Canada between 2008 and 2018

Intervention name	Description	Province	Setting	Intervention goals	Timing	Organization
ASPIRES Smart Prescribing	Vancouver Coastal Health Authority conducted an authority-wide stewardship program including the development of clinical practice guidelines, audit and feedback of anti-infective prescriptions, nurse education and development of clinical tools.	BC	Healthcare	Improve patient care, reduce inappropriate anti-infective use, prevent antimicrobial resistance	2013	Vancouver Coastal Health
EQIP	The Ministry of Health used administrative data to provide individual feedback on UTI and URTI prescribing to doctors.	BC	Healthcare	Improve physician prescribing	Not reported	BC Ministry of Health
LTC Training	Academic detailing provided by Ministry of Health to long-term care staff and doctors about diagnosing UTI and not treating asymptomatic bacteria	BC	Long-Term Care	Reduce treatment of asymptomatic bacteria	Not reported	BC Ministry of Health
Champlain LHIN Stewardship Campaign	Developed a program focused on leadership commitments, accountability, drug expertise, monitoring, reporting and education, which distributed guidelines from the Ottawa Hospital, developed a tool for sharing data between pharmacists and corresponded with pharmacists about Ontario's provincial program and new resources. Conducted educational sessions with one hospital, and weekly ASP rounds with a separate hospital	ON	Hospital	Support and assist in meeting individual hospital goals	2014	The Ottawa Hospital; Champlain LHIN
LTC Audit and Feedback	Audit and Feedback to LTC facilities	ON	Long-Term Care	Not reported	2018	Institute for Clinical Evaluative Sciences; Health Quality Ontario

PO = per os; URTI = Upper Respiratory Tract Infection; UTI = Urinary Tract Infection